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Healthy livestock on healthy grass are a delight to any ranchman's eye—and that's what this issue of SOIL CONSERVATION is all about.

As illustrated in this month's articles, ranchmen from Texas to South Dakota are enthusiastic, and justly so, about the Great Plains Conservation Program, which has brought them noticeable improvement of plant cover, reduction of erosion and soil losses, and economic benefits. Read on, and judge for yourself.

COVER: An impressive sight, a range fire at night, but burnt rangeland is not very pretty.

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Revolution on the Plains

by Dale D. Allen
Public information officer, SCS
Temple, Texas

The Great Plains Conservation Program (GPCP) is helping to prove the value of a new grazing technique in Texas.

Increased production, reduced labor costs, easier handling of livestock, and marked grassland improvement are some of the benefits. If the technique continues to be as successful as early reports indicate, it may revolutionize grassland management in the Southwest.

The new technique is called the short-duration grazing system, the high intensity-low frequency grazing system, or the one-herd system.

The idea is to concentrate cattle in one pasture instead of in several. Then when the forage is grazed down, the herd is moved to the next pasture in the rotation. As a result, a pasture is intensively grazed a couple of months or so, then rested 6 to 10 months.

More than 50 ranchers are using the technique in Texas, mostly on land covered by GPCP contracts. H. R. Stasney of Albany was one of the first. Stasney is a cooperator with the Lower Clear Fork of the Brazos Soil and Water Conservation District in northwest central Texas.

"We have been amazed how this new technique has worked for us," Stasney said. "The way our grass has responded is almost unbelievable."

Thick, knee-high grass waved in the breeze as we drove through four vacant pastures. Suddenly, we topped a hill and came to a pasture literally full of cattle.

"There are 200 2-year-old heifers and 13 bulls in this 187-acre pasture," Stasney told us. "These heifers have been in here about 2 weeks. But the pasture was rested most of last year. That's why the grass is so thick."

Stasney said that the cattle would remain in the pasture for 30 to 60 days. But the amount of forage left in the pasture dictates when the cattle are moved, not the calendar.

Stasney began using the short-duration grazing technique in 1969 because it became difficult to defer newly seeded areas and maintain a 100-cow herd.

In 1968, Stasney signed a conservation cost-share contract under the Great Plains Conservation Program. Because the newly acquired ranch had only two pastures plus two cropland fields, cross-fencing was high on Stasney's priority list. So was control of mesquite and lotebush, which had invaded the grassland.

While the place was being cross-fenced, Stasney started controlling brush. In 1968, about 400 acres of tight bottom-land soils, heavily infested with lotebush and pricklypear cactus, were rootplowed and seeded to a mixture of 'El Reno' sideoats grama, 'King Ranch' bluestem, and green sprangletop. The following year, mesquite on about 1,000 acres of upland was treedozed and raked; then the same grass mixture was planted.

Scattered motts of trees were left for wildlife, shade, and natural beauty.

During the time Stasney was

controlling brush and planting grass, he was maintaining a base herd of 100 mother cows and trying to defer grazing on treated land. Forage sorghum on his two cropland fields, totaling 104 acres, helped ease the grazing pressure.

Lendon Parker, SCS district conservationist at Albany, helped Stasney get started on the short-duration grazing system.

"In 1969, we decided that the only way to rest the newly tree-dozed and rootplowed areas was to put all the cattle in the forage sorghum fields," Parker said. "The entire herd was put in one of the fields about mid-May and left there for a few weeks. Then it was moved to the other field. Calves were sold in July, but the cows were alternated between the fields all summer.

"By September 1, the sorghum was gone, but a 330-acre pasture rootplowed and seeded the previous year was ready to graze. We decided to keep the herd intact on this one pasture. This allowed Stasney to continue resting the other pastures."

The cattle grazed the 330-acre pasture for about 3 months, which included the September-October calving season. Then about December 1, the herd was moved to a 180-acre pasture treated the previous year.

This system of grazing continued into 1970. When calves born in 1969 under the system were sold in 1970, they were the heaviest ever sold off the ranch. They averaged 540 pounds.

That clinched it. The system was continued and is still in effect.

Late in 1971, Stasney replaced his 100-cow herd with 200 purebred Angus heifers bought in Nebraska.

Parker says one reason why the grazing technique works so well is that it permits the utilization of the less desirable grasses. Under normal selective grazing, cattle tend to eat only the more palatable plants. This not only punishes the desirable plants, but it also allows the less palatable ones to go largely untouched. Then when the choice grasses start regrowth, they have to compete for moisture and sunlight with plants that have been underutilized. This is a cycle that the short-duration system helps break.

Stasney claims his grass improves so rapidly because the better plants have less competition from the less desirable grasses.

"The real test of the system came late in 1970 and during the first 7 months of 1971 when a record-breaking drought struck," says Stasney.

"During the drought, my neighbors ran out of grass, and most of them had to sell part of their herd. My grass never showed any stress. It started raining in August, but I could have made it into the winter without rain."

Mack Wooldridge, Stasney's business manager, is also enthusiastic about the new grazing technique.

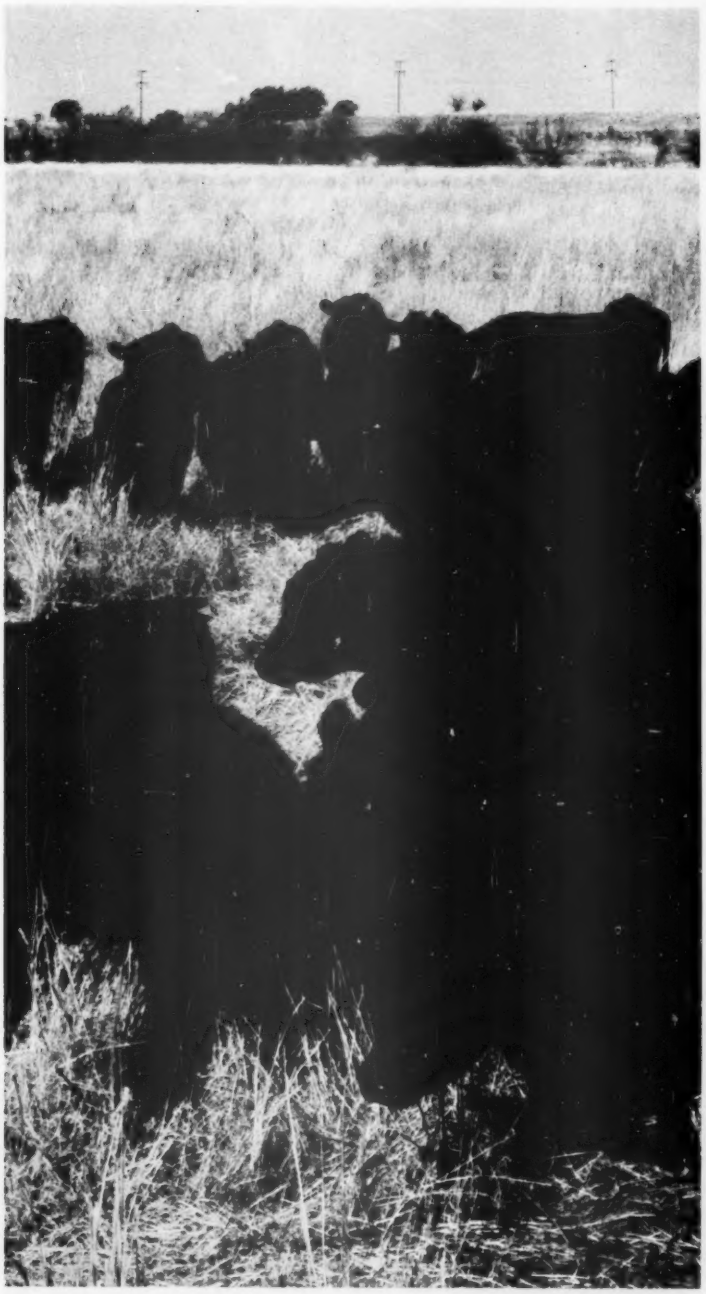
"Before, because we had only one small pasture and one large one, all covered with brush, it took eight cowboys a full day to round up the cattle. Now, one man can look after them. They are all in one pasture and are easy to feed and handle," says Wooldridge.

The six major pastures on the ranch range in size from 180 to 400 acres. A 39-acre trap doubles as a bull pasture, and a 94-acre utility pasture, which has been seeded to Selection 75 kleingrass, is saved mainly for weaning.

As we drove over the ranch, Wooldridge pointed out another advantage. Grass grew knee- to waist-high around every pond on the place—practically to the water's edge. There were no 30- to 40-acre beat-out areas around each pond as often occurs under traditional grazing systems.

District conservationist Parker pointed out two other advantages. "The new system can help break any parasite cycle that exists on a ranch," he said. "It could also reduce the number of bulls needed, especially if all the bulls are run with the herd.

"On the other hand, individual bulls could be bred to specific cows simply by breaking up the



(Opposite page) Two weeks before this photograph was taken, about 200 young cows and 13 bulls were removed from this 330-acre pasture after grazing there for 2 months. Pictured, left to right: H. R. Stasney, ranch owner, Lendon Parker, SCS district conservationist, and Mack Wooldridge, Stasney's business manager.
(Above) When the grass runs out on this pasture, the entire herd will be moved to another pasture.

herd into small, pasture-sized groups for a few months during breeding season. Then the entire herd could be regrouped."

Parker stressed repeatedly that this system is so flexible that it can fit almost any livestock operation. It doesn't matter if some of the pastures are two or three times as large as other ones in the system. You merely leave the cattle in a pasture until the grass is grazed down, then you move them. That's nature's way of grazing. The buffalo roamed in herds—they would graze an area, then move on.

"Ideally," says Parker, "you should have enough cattle in a pasture to harvest the grass in 60 days or less. That keeps the better grasses from being punished for excessive periods. You should record the dates of grazing so a pasture will not be scheduled for grazing at the same time each year."

Parker believes that a short-duration grazing system works best with six or more pastures. With fewer, the grazing periods would be too long and the rest periods too short to be effective.

Parker admits that the system is not a cure-all for overstocking. "Only properly stocked pastures should be considered for short-duration grazing," he says.

What impresses Stasney most about the system is the way it helps grass get better every year.

"When I first bought this place, my goal was to improve the grass to the point that it would carry 100 cows yearlong without having to feed hay. That goal has already been surpassed. Now, I believe I can make the place handle 200 cows or more. And running a cow and calf to 10 acres without having to feed them hay is practically unheard of in this part of the country."

Call it whatever you will, by any name, the technique works.

And it's probably here to stay. ♦

Welcome, well water

by Fred Trump
Information specialist, SCS
Salina, Kansas

In the Great Plains, where precipitation is scarce and erratic, underground water often makes the difference between success and failure for farmers and ranchers. Some places have underground water, and others don't.

The northern part of Logan County, in western Kansas, has abundant underground water. So does the Smoky Hill River valley, which crosses the county from west to east. But in the southern half of the county, you have to go deeper than 1,000 feet to find a reliable source of water.

Thus, at least half of Logan County has a water problem. A lot of water must be hauled to livestock. In some places, livestock must make frequent trips to the river for water. It's inevitable that they'll overgraze pasture close to the river and undergraze the higher ground.

Some Logan County farmers and ranchers have found another solution: pumping water to their rangeland and holding it in storage tanks. Some have chosen to use Rural Environmental Assistance Program cost-sharing provided through the Agricultural Stabilization and Conservation Service to obtain a dependable water supply, and others are using the Great Plains Conservation Program.

Lawrence Nieman, SCS district conservationist at Oakley, believes in the Great Plains Conservation Program.

To qualify for guaranteed cost-sharing under the program, landowners sign an agreement to carry out a total conservation program on their land over a period of 3 to 10 years.

As important as a water-storage system is, Nieman feels that a total conservation program is mighty important too. Proper grazing distribution on range and pastures as well as erosion-control measures on cropland should not be overlooked.

The first of two water-storage systems built last summer under

GPCP contracts was on the 2,359-acre ranch operated by Blair Kough and his son Mike. Their 200 head of cattle had been depending on three inadequate wells on the ranch, plus hauled water.

Now they are supplied by three, 2,800-gallon stock tanks, about a mile and a half apart, which are gravity-fed from a 6,000-gallon storage tank on the highest point of the ranch. The water is pumped 4 miles to the storage tank from a 20-foot-deep well in the river flood plain. The 1¼-inch pipe is buried about 4 feet deep.

The three stock tanks are 15 feet in diameter and have shut-off float valves and overflow pipe to prevent water waste and mudholes around the tanks.

At their own expense, the Koughs ran a lateral line to the house for home-water supply.

The second system in Logan County is similar to that on the Kough ranch but is unique in one respect: three ranchers shared equally in the cost of one complete water-storage system for all of their grasslands.

"The three ranchers happen to be brothers," says Nieman. "But the same sort of contract can be worked out with any neighbors and at considerable cost saving. Each would be sharing the same well, pump, line, and storage tank. Their only added cost would be extra laterals and tanks."

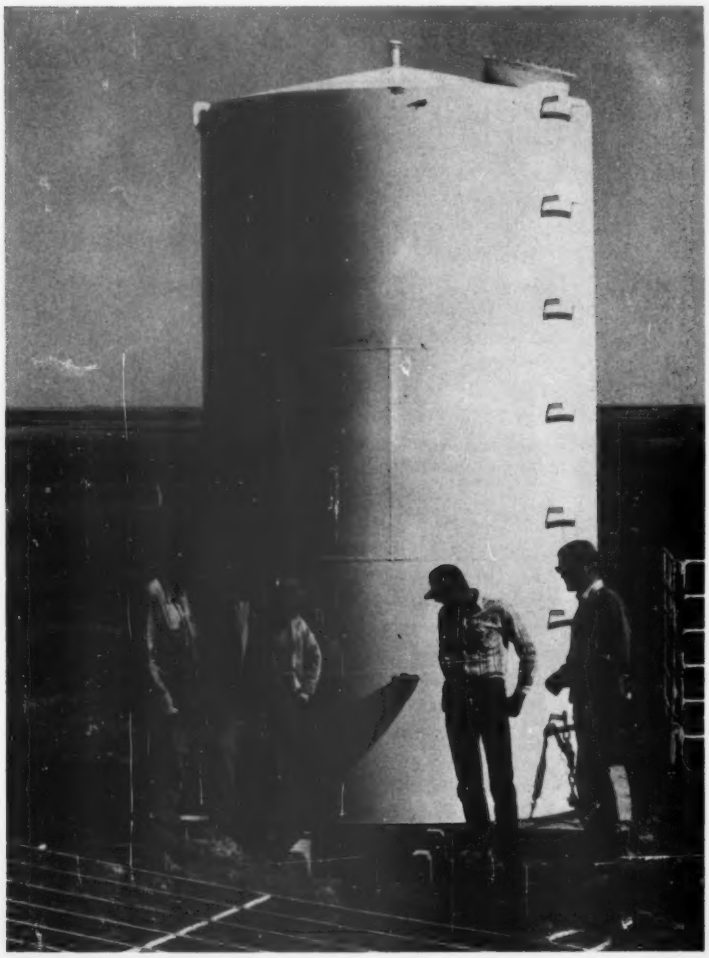
The Repshire brothers own three separate ranches totaling more than 2,800 acres. Formerly, their 300 head of cattle had to walk 2 miles a day one way and pass under a state highway to reach the river.

"To say that the pasture between the highway and the river was overgrazed is an understatement," comments DeWane Repshire.

The three brothers with help from SCS worked out a water-storage system that includes seven 12-foot watering tanks and more than 23,000 feet of pipeline. Their 5,200-gallon storage tank is located 210 feet above the river level. Easements to run the line beneath the state highway and a county road were no problem to obtain.

The Repshires paid the full cost of the storage tank and its concrete base, the pump, and pump fixtures. They also did a lot of the work themselves—like laying concrete, backfilling trenches, and installing the plumbing. GPCP shared in the cost of the well, the pipeline, and the tanks.

Plumbing on the plains, no doubt, will repay these Logan County ranchers many times over for their investment. ♦



By pooling their resources and with cost-sharing under the Great Plains Conservation Program, Harold, Lester, and DeWane Repshire brought a water-storage system to their rangeland in Logan County, Kansas. Lawrence Nieman, SCS district conservationist at Oakley, inspects the work in progress with the Repshire brothers. (Photograph courtesy of *The Farmer-Stockman*, Wichita, Kans.)

Fire on the range

On March 6, 1972, a range fire began near Mullen, in the Sandhills of Nebraska. Whipped along by a 40-mile-per-hour wind, the fire swept through prime rangeland in an 8-mile-wide swath. Ten thousand acres were consumed, then 20,000, then 50,000, then 100,000.

The fire swept towards the town of Thedford and the Nebraska National Forest, the largest manmade forest in the world.

This forest was hit by a grass fire in 1965 and lost one-third of its trees. Now, again the forest was threatened. U.S. Highway 83 was the last major firebreak; if the fire could be kept on the west side of the highway, the forest would be out of danger.

But the fire crossed the highway. Seven hundred volunteer firefighters stood between the fire and the forest. They met the fire with shovels and wet gunnysacks; they held it back until water pumpers and U.S. Forest Service slurry trucks could put it out.

The setting for this fire was familiar to oldtimers in the Sandhills. The winter had been dry, and by March there was little snow cover. The grasses—sand bluestem, little bluestem, prairie sandreed, blue grama, and hairy grama—were brittle, tinder-dry. The March winds blew 40 to 50 miles per hour. A passing motorist threw out a cigarette, and the destruction began.

The final tally: 120,000 acres of prime rangeland burnt to a crisp. Livestock losses were serious; some ranchers lost 50 percent of their herds. Cattle that were alive but severely burned were shot. Hundreds of tons of hay, for the calving season, were lost. Many buildings were destroyed.

(Above) The effects of a carelessly tossed cigarette.
(Right) Fire swept over the rangeland in the foreground on March 6, 1972. Active blowing sandhills are in the background.

That same day in March, seven other range fires were burning in Nebraska. A fire near Ravenna burned about 13,000 acres. A fire northwest of Burwell cleared an area 10 miles long by 1 to 3 miles wide through rough range.

Other fires were reported throughout the Great Plains States.

Fires can occur any time the grass is dry—generally from late fall to early spring.

Fire is a very real part of the ecology in this part of the country. The climate and environment favor grass, and grass encourages fire.

The primitive plainsmen, Plains Indians, and early ranchers periodically burned the grasslands to harvest wild game, to destroy insects, in warfare, or to increase summer gains on range steers.

Fire has had a great influence on the development of natural plant communities. It can have a temporary or permanent effect on the vegetation, depending on the soils, previous vegetation, time of burning, and management after the burn.

Ordinarily a grassland fire will consume everything above the ground. And with a strong wind

by Peter N. Jensen
State range conservationist, SCS
Lincoln, Nebraka

and native grassland. The dominant soils, those of the Valentine and Dunday series, vary in texture from loamy fine sand to fine sand. They are, as might be expected, extremely erodible. When an area is overgrazed, the soils start blowing. The result is blowouts.

Sandhill ranchers are well aware of the dangers of overgrazing. For years they have worked with their local soil and water conservation districts to establish and maintain vegetative cover.

The Great Plains Conservation Program was made to order for this area. Under GPCP contracts, the Soil Conservation Service helps ranchers to select proper land use and grazing management and to stabilize their rangeland. The program provides cost-share assistance with cross-fences, livestock water wells, windbreaks, range seeding, and blowout control. All of the Sandhills area is eligible for GPCP assistance.

But when the weather is dry and windy, the same grass cover that protects the rancher from blowouts becomes tinder-dry, and carelessness or a fluke accident can start a fire and destroy the work of years.

A fire has much the same effect as overgrazing—it strips the soil of cover and exposes it to the wind. The difference is that fire does a total job of destroying cover, and, unlike overgrazing, fire can't be prevented through a a management decision by the rancher.

A practical way to prevent all range fires still hasn't been found. There are numerous small fires in the Sandhills every year and occasional big ones. But though fires have not been prevented, their effects are being minimized by faster ways of putting them out and better ways of reclaiming burnt areas.

Throughout the Sandhills, all towns and cities have fire departments—fire equipment from 25 communities fought the Thedford blaze. Local ranchers have learned how to fight fires, and when a blaze starts, it can usually be put out in short order. Most ranchers have water tanks that are available for firefighting.

Reclamation is more difficult. A burned-out rancher hopes for immediate rain and high soil temperature to start grass growing and get quick soil protection. But even with the best circumstances, the rancher will have to keep his livestock off the burned areas for at least one growing season. Unless he rests these areas, the grass will fail to hold the soil.

The ranchers in the Thedford burn area got immediate assistance from the U.S. Department of Agriculture. SCS, working through the Grant-Hooker and the Blaine-Thomas Soil and Water Conservation Districts, is providing technical assistance. The Agricultural Stabilization and Conservation Service is cost-sharing deferred grazing and tree replacement. The Farmers Home Administration is making emergency loans mainly to replace livestock and buildings.

The burned-out areas will be rested for at least a growing season. Where blowouts have occurred, fencing, seeding, and mulching will be needed. Proper grazing management must be planned for years to come to build up the needed plant cover and restore the range.

Range fires still occur in the Sandhills of Nebraska, but local ranchers, by practicing modern range management and fire control, have achieved a range condition far better both economically and environmentally than that of a quarter century ago. ♦

driving it on, it can gain tremendous speed.

The fire hazard sits squarely in the path of the Great Plains Conservation Program (GPCP). All the accomplishments a rancher has achieved through longtime GPCP assistance can be swept away in a short time.

The Sandhills take in 19,250 square miles of rolling rangeland

Prescription for grass: lots of rest

by T. H. Pozarnsky
Range conservationist, SCS
Mobridge, South Dakota

Healthy range, healthy livestock.

"The Great Plains Conservation Program works," exclaims Blaine Drageset, a sheep and cattle rancher in Corson County, South Dakota. And as backup adds, "It's brought us higher weaning weights and more grass."

The 6,700-acre Drageset ranch includes 2,500 acres of leased range and nearly 1,400 acres of cropland. After buying the ranch in 1965, Drageset prepared a plan for its operation and used that as a basis for a GPCP contract with the Soil Conservation Service.

One of the main practices planned for and carried out is a system of range deferment. The objective is to increase the amount and vigor of the more productive grasses. This is accomplished by resting one-fourth of the grazing land, or about 1,300 acres each year. Grazing starts on pastures that had a full rest the year before. "This gives flexibility and a place to go with cattle in case of a dry year," Drageset explains.

"Since 1967 Agrifax Computer Services of the Production Credit Association has kept records of our operations. Adjusted weaning weights were 400 pounds per calf that year; these weights have increased each year since. In 1970 and 1971 weaning weights were almost 500 pounds per calf with a 92-percent calf crop. Our lamb weights were 95 pounds in 1970 with a lamb crop of 132 percent.

"No grain is fed, so grass reserves must be carefully controlled. We are increasing our livestock numbers very slowly. We never want to get ahead of the grass in either good or bad years. We graze the top half of the grass; what's left doesn't bother us. It's the amount produced and used that counts," says Drageset.

Drageset is a winner of the Greater South Dakota Soil and Moisture Achievement Program from the Corson County Conservation District. He has also been recognized by the Soil Conservation Society of America for "judicious management of natural vegetation." ♦

GPCP cooperative effort

by R. Steve Scheldt
Range conservationist, SCS
Sundance, Wyoming

Bluestem, wheatgrass, needlegrass—as high as a horse's withers.

Powder River country is rich in grass. And it is rich in the history and lore of the Sioux, the Cheyenne, and the Arapaho and of battles and bloodshed over claims to occupy and graze the lush range between the Big Horn Mountains and the Black Hills.

The Johnson County War, the last of the range wars, ended here with blood soaking the soil.

Drovers trailed thousands of cattle to the Montana and Wyoming territories through the Powder River country. The Texas, or Northern, Trail traversed the area on its route to Powderville, Fort Keogh, Miles-town, Mosby, the Judith Basin, Fort Benton, and points beyond.

It was along this trail that the Parks Land and Livestock Company was founded in 1907. Although by no means the largest in an area of cattle and sheep empires, its fences encircled 70,000 acres. Most of the land was in what became Crook and Campbell Counties in Wyoming; some was in what became Powder River County in Montana.

In May 1966, the Parks Company sold its holdings to two newly formed grazing associations. The Trail Creek Grazing Association, made up of 18 ranchers in need of more grazing land, bought 40,223 acres—the land in Campbell and Powder River Counties. The Rocky Point Grazing Association, with 19 members who also were cramped for land, bought 28,391 acres in Crook County.

A Great Plains Conservation Program (GPCP) contract had been in effect on the land since June 1959. The contract had been worked out by the Parks Company with the Soil Conservation Service furnishing guidance.

Conservation work completed at the time of sale involved $10,000 of federal cost-share funds and included wells, stock-water developments, range and pasture seedings, fencing, and an erosion-control structure.

When the grazing associations bought the property, they agreed to continue the practices called for in the GPCP contract. The Rocky Point Association took over the original contract with SCS and qualified for a contract extension of up to 10 years carrying the usual ceiling of $25,000 in federal cost-share funds. The Trail Creek Association entered into a new GPCP contract.

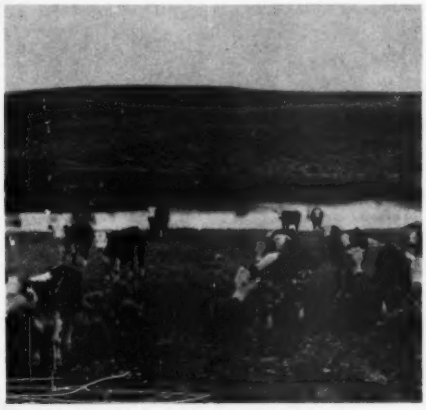
The Rocky Point Association discovered early that in addition to technical help from the Soil Conservation Service, which administers the Great Plains Conservation Program, it needed help and cooperation from other federal and state agencies.

The association moved cattle into its pastures along with large herds of sheep, and immediately it had problems. Two breeding dates for the cattle plus the grazing requirements for the sheep complicated the forage-management system. More watering places and about 6 miles of additional cross-fences were needed. But if the problem were to be adequately solved, some of the fencing had to cross public land under the Department of the Interior's Bureau of Land Management.

The association found BLM eager to cooperate. Fencing that crossed BLM land was installed according to BLM specifications.

As part of its brush-management program on 3,875 acres, the association left areas undisturbed to provide a habitat for antelope, deer, and sage grouse. The Wyoming Game and Fish Commission provided ready assistance.

One stock-water dam was enlarged and four stock-water pits were dug with GPCP cost-share funds. Two additional pits were dug with cost-share help from the Department of Agriculture's Agricultural Stabilization and Conservation Service. Five are to be added with Bureau of Land Management help.



A stock-water pond constructed for better grazing distribution. Such ponds provide water in many areas that otherwise could not be used for grazing.

Other federal cost-share funds will be used in installing an additional half-mile of fence, in managing sagebrush on 1,400 acres, and in establishing dryland pasture on 740 acres of rangeland.

Members of the Rocky Point Association are quick to agree that "cooperation is the name of the game." ♦

conservation in action

The 5,000th in Oklahoma

Sam Karber walked into the Soil Conservation Service office in Beaver, Oklahoma, last summer to get information about livestock lagoons. He walked out with an application to participate in the Great Plains Conservation Program. Little did he know of the fame that was to follow.

After completing a conservation plan for his 280-acre farm in northern Beaver County, Karber signed a GPCP contract. Not many days later he learned that he had signed the 5,000th contract in Oklahoma since the program began there in 1957.

The story of this landmark contract was carried by local, regional, and state news media, and Karber and his wife, Jan, received widespread attention.

Karber's contract calls for 27,000 feet of terraces, 7,600 feet of diversion terraces, an erosion-control dam, a disposal lagoon, 95 acres of cropland seeded to native grasses, and a conservation cropping system for the remainder of the cropland.

Local conservation districts provide leadership and direction for the Great Plains Conservation Program. In Oklahoma, GPCP contracts take in more than 4 million acres and obligate more than $14 million in cost-share funds for conservation work.

Beaver County leads the state with 464 contracts. These take in more than 500,000 acres and obligate more than $1 million in cost-share funds.

Karber and his wife grew up in Beaver County. They chose to buy a farm rather than live in the city. Both think that a farm is a better place to raise a family.

Karber says he made a smart move in inquiring about the Great Plains Conservation Program. He not only got the lagoon he needed but also a conservation program for his entire farm —and a little publicity.—JOHN T. RILEY, *district conservationist, SCS, Beaver, Oklahoma.* ♦

Sam Karber signs Oklahoma's 5,000th GPCP contract as his wife, Jan, and district conservationist John T. Riley look on.

Bringing back the sea of grass

In the late 1950's there were few ranchers in Kent County, Texas, who believed that a mesquite thicket could be transformed into a sea of grass. Since then the Great Plains Conservation Program has made believers out of the entire county.

Rangeland productivity in Kent County has been increased primarily through improved grazing management, which includes proper grazing use, deferred grazing, and better distribution of grazing.

In the late 1800's the first settlers in this plains area were welcomed by grass that was wagonbed high and stirrup deep. Mesquites were so scarce that firewood was hard to find.

As more ranchers moved into the county, they brought more cattle and barbed wire. They thought the sea of grass would last forever. But overgrazing, coupled with fire and drought, destroyed the grass and turned the prairie into an almost barren, brush-covered desert.

In 1957 the Conservation Needs Inventory for Kent County revealed a startling fact: Of the 481,786 acres of rangeland in

the county, 480,463 acres needed conservation treatment. About 347,000 acres needed brush control, and 61,700 acres needed range seeding before improvement of the grass cover could be expected. About 385,000 acres were being overgrazed.

Restoring this grassland to its once lush condition seemed impossible.

But in 1956 the U.S. Department of Agriculture began its Great Plains Conservation Program, and within a few years Kent County cooperators with the Duck Creek Soil and Water Conservation District had entered into 90 Great Plains Conservation Program contracts, covering 372,709 acres, or 66 percent of the county.

Conservation practices applied with cost-share assistance included 144,473 acres of brush control; 30,257 acres of range seeding, 2,700 acres of which was marginal cropland; 61 ponds; 60 livestock water wells; 274,028 feet of livestock water pipeline; and 334,298 feet of cross-fences. In addition, brush control and range seeding were carried out on many acres without cost-share help, and various grassland management practices were applied to the better grasses to help them respond to conservation practices.

Great Plains Conservation Program cost-share funds for Kent County have amounted to $2.6 million; farmers and ranchers have spent a similar amount.

The GPCP has been instrumental in proving that grassland restoration is feasible and practical. Kent County, Texas, welcomes back its sea of grass.—RHETT JOHNSON, *district conservationist, SCS, Jayton, Texas.*♦

The grass will take care of you

"Take care of the grass, and the grass will take care of you," says Otto Uhrig, a cooperator of the Box Butte County Soil and Water Conservation District in the Nebraska panhandle.

Uhrig's 3,200-acre ranch, which is 28 miles northwest of Alliance, clearly demonstrates the benefits of a planned grazing system.

He has had a Great Plains Conservation Program contract since 1967 and feels that he is reaching his goal of improved grazing efficiency through a combination of range conservation practices.

About 1,700 rods of cross-fencing and five livestock wells have been installed during the past 5 years to develop a system of deferred-rotation grazing. A two-section pasture, for example, was subdivided by cross-fences into three pastures of equal size.

Uhrig is quick to comment that tall grasses, such as prairie sandreed and sand bluestem, are replacing the short grasses. They are also pushing out the fringed sagewort.

Uhrig says, "I've even been able to increase my stocking rate to realize 10,000 additional pounds of beef annually while improving the condition of my pastures. Not only that but my labor needs have been reduced. Also, I keep fewer bulls now because the cows are more concentrated.

Otto Uhrig notes the greater uniformity of grazing that has resulted from the deferred-rotation grazing system on his Nebraska ranch.

"The extra forage that comes from a good deferred-rotation grazing system is insurance against the dry years," says Uhrig. "And the greater ground protection means less erosion."

The Great Plains Conservation Program is helping the Uhrig ranch reach maximum production and profits.—WARREN PEDEN, *range conservationist, SCS, Rushville, Nebr., and* EUGENE YOUNGMAN, *district conservationist, SCS, Alliance, Nebr.*♦

Review

Books

Range Developments and Improvements. By John F. Valentine. *1971. Brigham Young University Press, Provo, Utah. 516 pp., illus. $10.95.*

Rangeland and related lands that produce natural pasturage make up about one-half of the total land area of the United States.

Range science and the application of scientific principles of management to this vast land area have reversed the trends of deterioration that resulted from early misunderstanding and mismanagement of the range resources by the first stockmen.

Today, rangeland managers and owners are treating rangeland as an ecosystem where physical, biological, and social factors and their interrelationships are considered in management decisions and systems.

Valentine's book is unique; it is the first comprehensive book-length treatment of this phase of range science. It fills a void by bringing together the vast amount of research data on manipulating range plants, mechanical land treatment, fertilization, rodent and insect control, and range facilities such as water developments, fences, and trails and walkways.

Valentine points out early in his book that range developments and improvements can be justified and economically used only when the proper grazing management techniques are used. Proper degrees of grazing use, planned grazing systems, seasonal use, range readiness, and other management techniques must be carefully considered for each rangeland system.

The author gives an extensive research bibliography for each chapter, and he has used many SCS photographs to illustrate his book.

Range Developments and Improvements is a badly needed reference for students, researchers, and range managers in general. It will take an important place alongside other rangeland text books and modern ecological studies of rangeland ecosystems.—Robert E. Williams, *Assistant to the Administrator for Environmental Development, SCS, Washington, D.C.*

New publications

Man, Nature, City, the Urban Ecosystem. *1971. U.S. Department of the Interior, National Park Service, Urban Ecology Series 1.* [*20*] *pp., illus. $0.20.* Discusses the function of cities, the city as a biological community, and "creating the urban ecosystem . . . and degrading it." This booklet is intended as a reminder to engineers, city planners, and architects that, while virtually any conditions can be engineered, the goal of their efforts should be establishing the most favorable conditions for man and that these conditions can best be achieved through ecological understanding and management.

Water Quality Criteria Data Book, Volume 3, Effects of Chemicals on Aquatic Life. By Battelle's Columbus Laboratories for the U.S. Environmental Protection Agency. *1971.* [*529*] *pp. $3.75.* Presents alphabetically by chemical original data from more than 500 technical publications concerning the specific effects of chemicals on individual species of aquatic biota. A *Species Index* facilitates search for information on the toxicity of chemicals to individual aquatic species. Discusses the details of major procedures in laboratory bioassay and field assessment of chemical toxicity in water; includes freshwater and marine procedures. About 1,000 references were utilized in preparing this report.

Methods of Predicting Solid Waste Characteristics. By Gail B. Boyd and Myron B. Hawkins. *1971. U.S. Environmental Protection Agency. 28 pp., illus. $0.40.* Reports on a study concerned with a waste prediction technique based on the hypothesis that the wastes discarded by a community derive primarily from the goods and materials consumed or used by that community (i.e., "inputs"); therefore, one can predict the amount and nature of these waste "outputs" by identifying what goods and materials constitute the community's inputs and by knowing how the community acts on these inputs.

An Engineering-Economic Study of Cooling Pond Performance. By Littleton Research and Engineering Corporation, Littleton, Mass., for the U.S. Environmental Protection Agency. *1970. 173 pp., illus. $1.50.* Presents an analytical procedure for predicting the steady state and transient temperatures of condenser cooling water obtained from a cooling pond. The predictions require knowledge of the monthly average climatic and power plant operating parameters. Measured water temperatures for several operating cooling ponds distributed over a wide region of the United States are compared to values predicted on the assumption of fully mixed ponds and slug flow ponds.

Nutrient Sources for Algae and Their Control. By Dr. George P. Fitzgerald for the U.S. Environmental Protection Agency. *1971. 77 pp., illus. $1.00.* Presents a critical evaluation of bioassays for nutrient availability made to define the conditions and limits under which each method can give meaningful results.

Proceedings, 1972 Annual Technical Conference. *1972. Sprinkler Irrigation Association (1000 Vermont Avenue, N.W., Washington, D.C. 20005). 72 pp. $8 to nonmembers.* Includes 12 articles on different aspects of sprinkler irrigation and the banquet address, "Some Ecological Implications of Irrigated Agriculture," by the president of New Mexico State University.

Effects of Feedlot Runoff on Water Quality of Impoundments. By William R. Duffer, R. Douglas Kreis, Curtis C. Harlin, Jr., and Robert S. Kerr for the U.S. Environmental Protection Agency. *1971. 53 pp., illus. $0.65.* Presents the results of a study to determine the effects of wastes transported in rainfall runoff from a beef cattle feedlot on the water quality of a small impoundment. Areas of consideration were chemical degradation of water quality and structural changes in the communities of aquatic organisms.

The Shape of Things to Come. *1971. Proceedings of the 26th annual meeting of the Soil Conservation Society of America, August 15-18, 1971, (Soil Conserv. Soc. of America, 7515 Northeast Ankeny Road, Ankeny, Iowa 50021). 262 pp., illus. $5.* Contains more than 60 papers that give current and timely information covering a diversified array of natural resource conservation disciplines. The subjects discussed include land-use planning, natural vegetation, urban-suburban conservation, water resources management, outdoor recreation, solid waste management, conservation research, surface mined area development, and trends in conservation and environmental quality. Among the papers are two by students on environmental education and phosphate pollution.

Eastern Forest Insects. By Whiteford L. Baker. *1972. USDA Misc. Publ. 1175. 642 pp., illus. $5.* Supersedes U.S. Department of Agriculture Miscellaneous Publication 657, *Insect Enemies of Eastern Forests.* The author, a retired USDA Forest Service entomologist, reviews the literature on eastern forest insects published since 1940, discusses insects occurring either entirely in those parts of the United States lying east of the 100th meridian or in both the eastern and western halves of the country, and gives the identification, distribution, host relationships, and life histories of insects occurring in eastern forests.

Finishing Yearling Steers on Pasture with Grain. By A. E. Spooner and Maurice L. Ray. *1972. University of Arkansas Agricultural Experiment Station Bull. 772. (Fayetteville).* Reviews the results of experiments, conducted from 1965 to 1970, in which steers were fed grain while on pasture. Data indicate that beef cattle producers can combine a program of wintering of weaned calves to 700 pounds or more by April with a program of full feeding on tall fescue-white clover pasture for 60 to 75 days to produce mostly choice 950- to 1,000-pound animals.

Catfish Processing . . . A Rising Southern Industry. Jesse R. Russell. *1972. USDA Economic Research Service Agr. Econ. Rpt. 224. 33 pp., illus.* Describes the catfish processing industry in nine southern states in 1970 and attempts to determine factors affecting the economic operation of the 16 plants surveyed.

Chlorinated Municipal Waste Toxicities to Rainbow Trout and Fathead Minnows. By Bureau of Water Management, Michigan Department of Natural Resources for the U.S. Environmental Protection Agency. *1971. 49 pp., illus. $0.60.* Reports the results of separate studies at four municipal wastewater treatment plants in Michigan. Ten rainbow trout and 10 fathead minnows, each previously acclimated to the river, were held for 96 hours in live boxes in the receiving stream above and below the outfalls of the plants.

Solid Waste Management: Abstracts and Excerpts from the Literature, Vols. 1 and 2. *1970. U.S. Dept. of Health, Education, and Welfare, Public Health Service Pub. 2038. [467] pp. $4.* An auxiliary report covering the literature search and data collecting activities carried on as a part of the major research project "Comprehensive Studies of Solid Waste Management" by the University of California.

Soil survey

George County, Mississippi. By Rex E. Davis. *1971. 58 pp., illus.; maps 3.17 inches to the mile (1:20,000).*

Desha County, Arkansas. By Hiram V. Gill, Fred C. Larance, Hardy Cloutier, and H. Wade Long. *1972. 48 pp., illus.; maps 3.17 inches to the mile (1:20,000).*

Gladwin County, Michigan. By Wesley Mettert. *1972. 112 pp., illus.; maps 4 inches to the mile (1:15,840).*

Yellowstone County, Montana. By James C. Meshnick, F. T. Miller, J. H. Smith, L. Gray, and W. C. Bourne. *1972. 133 pp., illus.; maps 3.17 inches to the mile (1:20,000).*

Dauphin County, Pennsylvania. By W. Merrill Kunkle, Garland R. Lipscomb, and Richmond Kinnard. *1972. 104 pp., illus.; maps 4 inches to the mile (1:15,840).*

Thurston County, Nebraska. By Norman L. Slama, Dean W. DaMoude, Donald E. Kerl, and John J. Foreman. *1972. 64 pp., illus; maps 3.17 inches to the mile (1:20,000).*

Banks and Stephens Counties, Georgia. By George G. Brock. *1971. 78 pp., illus.; maps 4 inches to the mile (1:15,840).*

Utah County, Utah, Central Part. By John L. Swenson, Jr., Warren M. Archer, Karl M. Donaldson, Jungi J. Shiozaki, J. Howard Broderick, and Lowell Woodward. *1972. 161 pp., illus.; maps 3.17 inches to the mile (1:20,000).*

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From the Administrator:

A model from the Plains

The Great Plains can be a pleasant place to live—millions of Americans choose to make their homes in that 10-state region. A sizable chunk of America's crops and livestock is produced there.

The Plains also can be a harsh place to live—when the summers get hotter and the winters colder and the winds stronger and the moisture scarcer than just about anywhere else.

This region of erratic climate, called "semiarid" in polite circles, has entered another cycle of dry years, like those of the 1930's and 1950's but with less property damage and human suffering.

Many landowners who took care of their land last year with technical and financial help through USDA conservation programs were able to come through the severe drought by making only a modest reduction in livestock numbers. Other landowners had to cut their herds back sharply.

This year, moisture and wind erosion vary widely throughout the region, but overall figures for the "blow season" just ended show that acreage of land damaged by wind erosion decreased by more than 50 percent compared with last year's figures. Some of the improvement can be attributed to the emergency tillage by landowners on 2.8 million acres and to other practices applied with the help of SCS and conservation districts through the Great Plains Conservation Program.

More than 3.2 million acres were in condition to blow. This, too, is less than half of last year's figure, but it indicates a need for greater effort to protect the land.

Farmers and ranchers need to prepare for whatever may be on tomorrow's weather map by avoiding overgrazing, disturbing the soil as little as possible during seedbed preparation and tillage operations, performing emergency tillage when needed, and working to insure adequate plant growth and effective crop residues. Nonfarm landowners have the same challenge to protect their property.

Whatever the weather map shows, practices under the Great Plains Conservation Program have proved their helpfulness in protecting against several environmental and social effects of wind erosion. The program's reliance on local leadership in determining priorities for assistance has proved sound.

In 1969 the Congress thought well enough of the Great Plains Conservation Program to extend it for 10 years. The Congress strengthened it by adding further specific provisions for assistance in control of agricultural pollutants, in conservation work on nonfarm property, and in practices for fish and wildlife.

Landowners, SCS conservationists, and district leaders have a challenge here to move ahead strongly on these new opportunities.

Kenneth E. Grant